

## GEOMETRIC SEQUENCES

- THE SUM OF THE FIRST  $n$  TERMS OF A

GEOMETRIC SEQUENCE IS FOUND BY USING

$$S_n = \frac{a(r^n - 1)}{r - 1}, \quad r \neq 1$$

$a = 1^{\text{st}}$  TERM

$r =$  COMMON RATIO

$n =$  # OF TERMS

Q6 Find the sum of the 1<sup>st</sup> 8 terms of

the sequence 3, -6, 12, ...

Soln

$$S_n = \frac{a(r^n - 1)}{r - 1}$$

$$S_8 = \frac{3((-2)^8 - 1)}{-2 - 1}$$

$$S_8 = \frac{\cancel{3}(256 - 1)}{\cancel{-3}}$$

$$S_8 = -255$$

~~DE~~

WHAT IS THE SUM  $2 + 1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots$

HOWEVER, IF WE ADDED UP THE AMOUNT (CONTINUOUSLY)  
OUR ANSWER (TOTAL) WOULD GET CLOSER AND CLOSER TO 4

— THE SUM OF AN INFINITE GEOMETRIC SERIES

IS FOUND BY USING

$$S = \frac{a}{1-r}, \quad |r| < 1$$

$a = 1^{\text{st}}$  term common ratio

~~DE~~  $3 + 9 + 27 + \dots$   $r = 3$   $|r| > 1$

NOT AN INFINITE SERIES

$$\underline{IV} \quad 3 + 1 + \frac{1}{3} + \dots$$

$$r = \frac{1}{3} \quad |r| < 1$$

✓ GEOMETRISCHE REIHE

$$S = \frac{a}{1-r}$$

$$S = \frac{3}{1 - \frac{1}{3}}$$

$$S = \frac{3}{\frac{2}{3}}$$

$$\left( 3 \div \frac{2}{3} \Rightarrow 3 \times \frac{3}{2} = \frac{9}{2} \right)$$

$$S = \frac{9}{2} \quad (4.5)$$

H/W Pg 67 # 1-5

Pg 79 # 1 A, C, E...

# 2, 3